

### Summary

Applicant Name	Mohammad Shehar Yaar Tausif
Application ID	168172
Application Status	Complete
Applying for Year	2024

Personal Information	
Given Name	Mohammad Shehar Yaar
Middle Name(s)	
Surname(s)	Tausif
Additional Email	
Gender	Male
Date of Birth	18 Apr 02
Passport Valid	Yes
Citizenship	India
Second Citizenship, if applicable:	
Country or region where you are enrolled full-time at an accredited university	India
Do you have any current/past affiliations with military or government organizations?	No
Personal Information Consent Statements	
ECS	
I acknowledge that I wish to receive information directly from Mitacs, or Mitacs's Canadian university partners about opportunities for international studies via email. I understand that I can withdraw consent at any time, subject to contractual restrictions and reasonable notice, by contacting <a href="mailto:helpdesk@mitacs.ca">helpdesk@mitacs.ca</a> , for any of the express purposes identified above.	Yes
I acknowledge that I consent to being contacted by Mitacs for research purposes within five years of having applied to this program. This consent applies regardless of whether or not my application is successful. I understand that I can withdraw consent at any time, subject to contractual restrictions and reasonable notice, by contacting <a href="mailto:helpdesk@mitacs.ca">helpdesk@mitacs.ca</a> , for any of the express purposes identified above.	Yes

Education	
Home Institution	Indian Institute of Technology Kharagpur
Academic Department	Mining Engineering
Province/State/Prefecture of Home University	West Bengal
Discipline Category	Engineering
Only for Chinese applicants: National ID card number	
Enrolled Program Type	Combined undergraduate/Master's

Your current program	
<b>Anticipated Month of Graduation</b>	7
<b>Anticipated Year of Graduation</b>	2025
<b>Average Grade</b>	82.7
OPTIONAL – English or French Proficiency Exam	
<b>Have completed an English or French Proficiency Exam</b>	No
<b>English or French Proficiency Exam Name</b>	
<b>Exam Score</b>	0
<b>Max Possible Score (out of)</b>	

### Background and Research Interests

<b>General description of skills, background knowledge, research interests and experience</b>	I'm a student with a solid foundation in Linux, Distributed Systems, and Computer Networks. I'm skilled in programming with languages like C, Go, Javascript and Python, and have hands-on experience with Unix and cloud tools. My internships have allowed me to delve into system setup and cloud applications. My understanding is further deepened by studying foundational texts, including works by Computer Networks by Tannenbaum and Distributed System Concept and Design by Coulouris. I also conducted extensive research and documentation of network infrastructure at IIT Kharagpur. I am an honest and diligent and plan to work with full commitment.
<b>Notable Achievements</b>	1) My team secured the 1st position at the Inter IIT Technology Meet (2023) - ISRO Event, a prestigious annual tech event where all the IITs in the country compete. I integrated AWS S3 with Python backend and wrote a scraping python script for lunar images. 2) My team secured the 1st position at the Interhall OpenSoft 2022 at IIT Kharagpur, an important tech event that is part of the General Championship at IIT Kharagpur. I developed the backend for the product and single-handedly set-up a robust cloud infrastructure using Docker and Kubernetes,

In your ideal internship project, how frequently would you be engaged in the following activities?

Activity	Frequency
Analyzing data or information	Often
Conducting surveys or administering questionnaires	Sometimes
Conducting interviews	Sometimes
Creating drawings, models, or designs	Sometimes

Gathering information from archives, published works, documents, or recordings	Very often
Making observations outside of a laboratory or controlled environment	Often
Performing controlled experiments	Sometimes
Programming, scripting, or coding	Very often
Reading research literature	Very often
Solving mathematical problems	Often
Using hand or machine tools, laboratory equipment, or scientific instruments	Sometimes
Writing reports	Often
Meeting or discussing with the supervisor	Very often
Working on tasks that require teamwork	Very often
<b>Have you completed any research outside of your degree coursework?</b>	
If "yes", approximate number of hours	500+
If "yes", description of work	At Neverinstall, I researched into Linux Kernel documentations and handling of virtual devices to integrate virtual mouse, touchscreen and keyboard into the virtual desktop. Due to scarce documentation of Xorg and X11 libraries, I went through source code of multiple X client applications and X11 libraries like xrandr and xinput. I referred to multiple protocol specifications related to the X server such as XRender, XFixes, XDamage and X Selection. I applied out of the box solutions to support arbitrary and dynamic resolutions in X server. At SecureThings, I researched into custom HSM integration in Azure with provisioning of devices.

Experience with Mitacs	
How you heard about Mitacs	Your home institution's website
Available for at least 12 weeks in the summer of 2024	Yes
If "no", amount of time that you expect to be available	
<b>Experience with Mitacs Consent Statements</b>	
I acknowledge that I will be available to arrive for my internship between May 1, 2024 and July 31, 2024. I will disclose my availability to potential host professors during the matching process.	Yes
I have been awarded a Globalink Research Internship project in the past.	N/A

Academic Reference	
If you uploaded a reference letter document yourself (Option 2), the filename will be displayed here.	
The full file (if uploaded) will be displayed at the end of this document with any other files uploaded to your application	
<i>Any reference letters uploaded by your invited references are confidential and their content will not be visible to you .</i>	
File Type	File Name

Self-upload reference	shehar_lor.pdf
Reference 1	Did not upload
Reference 2	Did not upload

## Acknowledgements

### Acknowledgement Declaration

By submitting my application to the Globalink Research Internship, I:

- Acknowledge that the Globalink Research Internship is an initiative funded by the Canadian federal and provincial governments and by international funders. Canadian government funders require regular monitoring and reporting to ensure transparency of public funding. International funders may also require information for reporting and payment purposes and to approve internships. Mitacs will share your application information with these funders in accordance with its Privacy Commitment to Program Participants (<https://www.mitacs.ca/en/website-privacy-statement>).
- Acknowledge that Mitacs will share part or all of the application and any supporting documentation provided, as required, with any professors who are supervising projects for which I am applying through the Globalink Research Internship Student Application. Those professors agree to keep this information confidential before having access to it.
- Declare that I am 18 years of age or older at the time of submitting this application, which is when this consent becomes active. In Canada, the age of majority (or the age of adulthood) is 18 years of age. Mitacs Globalink Research Internships are only open to those 18 years of age and older.
- Hereby swear that the information contained within this application is true and accurate to the best of my knowledge at the time of submission. I understand that Mitacs and its funding partners will not tolerate any misrepresentation of information provided in this application, and if I am found to be providing wrongful information or copying any part of this application, my application will be terminated.
- Understand that Mitacs reserves the right to make determinations about my eligibility to participate in a Globalink Research Internship and is not required to divulge specific information about the adjudication of my application.
- Acknowledge that if I am selected for a Globalink Research Internship I must possess a passport that is valid until January 2025. I agree to provide a copy of my passport and passport information to Mitacs no later than February 28, 2024.
- Acknowledge that if I am successful, I must adhere to the [Participant Expectations](#) and Mitacs Programs' [Terms and Conditions](#), which outline participant's responsibilities.

### Acknowledgement Consent Statements

Have you read the Mitacs Globalink Research Internship Acknowledgements?	Yes
Do you agree to the Mitacs Globalink Research Internship Acknowledgement statements?	Yes

## My Projects (maximum of 7)

Rank	Province	Professor Name	Project Title
1	Ontario	Ajmery Sultana	Design a computationally efficient consensus protocol for blockchain based D2D/IoT system
2	British Columbia	Mohammad Shahradd	Multi-Cloud Serverless Computing
3	Ontario	Ajmery Sultana	Software-Defined Networking (SDN) Integration for Blockchain-Based IoT Edge

4	British Columbia	Thomas Pasquier	Securing Linux eBPF framework
5	Québec	Kaiwen Zhang	High-performance practical blockchain systems
6	Ontario	Sébastien Mosser	P4 Language in a DevOps Ecosystem
7	Québec	Kodjo Agbossou	Automated deployment of intelligent systems for distributed energy resources management

## Documents

Documents you uploaded to the “Documents” section of your application, including your resume/CV and transcript, are displayed in the following pages.

File Type	File Name
Resume	sheharyaar_mitacs.pdf
Transcript 1	gradeCard.pdf
Transcript 2	Did not upload
Transcript 3	Did not upload
Transcript 4	Did not upload

# Mohammad Shehar Yaar Tausif

[sheharyaar48@gmail.com](mailto:sheharyaar48@gmail.com) | [linkedin.com/lagnos](https://www.linkedin.com/company/lagnos) | [github.com/sheharyaar](https://github.com/sheharyaar)

## SUMMARY

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A passionate student at IIT Kharagpur with a keen interest in Linux, Distributed Systems, Computer Networks and Blockchain. I often read books and research papers to grasp in-depth understanding of the subject. Having delved deep into George Coulouris' book on Distributed Systems, I am eager to work on cutting-edge technologies and contribute to innovative projects

## EDUCATION

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**Indian Institute of Technology, Kharagpur**

2020 – 2025

Integrated Dual Degree (B.Tech + M.Tech)

CGPA - 8.27

Relevant Coursework: Programming & Data Structures, High Performance Computing, Ubiquitous Computing

## TECHNICAL SKILLS

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**Programming Languages:** C, Go, Javascript/Typescript, Python, Fortran, Bash Scripting

**Libraries and Frameworks:** React, NodeJS, GNU C Library, GNOME Library, POSIX System APIs, Xorg, DBus

**Core CSE Skills:** Data Structures & Algorithms, Operating System Concepts and Inter-Process Communication (IPC), Computer Networks and Socket Programming, Distributed Systems

**Cloud:** AWS, Docker, NGINX, Kubernetes, Git, Github Actions

## WORK EXPERIENCE

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**NeverInstall**

Bangalore, Karnataka, India

Software Engineer Intern | *Cloud, C, Go, UNIX, Docker, k8s, bash*

March, 2022 - Present

- Setup Linux infrastructure for the virtual desktop and configured the system for use within containers. Managed multiple critical bash scripts and Dockerfiles for the organisation.
- Accomplished **enhanced system observability and modularity** by decoupling Gstreamer streaming logic from the streaming server and implementing a sophisticated health monitoring system. Established separate control and data planes leveraging **DBus** and **UNIX sockets**.
- Achieved **seamless integration of AI and LLM actions within virtual desktops** by implementing IPC over DBus between side-car containers. Built an end-to-end flow for automated GPU hotplugging, analysed and created multiple Xorg based programs for handling display requirements.
- Improved **system safety and reliability** by **creating thread-safe Foreign Function Interfaces (FFI) for Xorg and Gstreamer C libraries in Go**. Enabled internet-based native desktop experiences for users by integrating multiple technologies like WebRTC, AT-SPI, Gstreamer and implementing virtual I/O devices (mouse, keyboard, touchscreen) within containers.

**SecureThings**

Pune, Maharashtra, India

Software Engineer Intern | *C*

February, 2023 - June, 2023

- Developed a **multithreaded framework** that effectively processed high-volume data ( ~1Gbps ) from an OEM device, leading to **optimal resource utilization and low latency** by leveraging JSON over Unix sockets.
- Implemented a **lightweight and thread-safe processing system** that supported dynamic rules and locally executable scripts, achieving **flexible and efficient processing of device metrics**.
- Enhanced **security and authentication of an automobile embedded device** by conducting research and integrating a custom HSM with Azure provisioning. Successfully transitioned from SSL/TLS authentication by leveraging private/public keys from HSM slots.

## PROJECTS

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**DNS Logger** | *Go, pcap, eBPF, networking*

October, 2022

- Accomplished **efficient per-packet filtering** by **developing an extensible DNS Logger using pcap and eBPF filters** leveraging Go libraries.
- Established a **channel-based buffered pipeline**, enabling **seamless transmission of processed packets** to time-series databases like Axiom.

Project Link : <https://github.com/sheharyaar/dnslogger>

- **Researched** and documented extensively on the Internet infrastructure at IIT Kharagpur campus. Identified various issues and internal loopholes of the system.
- Created a detailed tutorial on setting up OpenVPN and **benchmarked** various VPNs based on their speed, latency and various details like ports and encryption used by the service.  
Repo Link: <https://github.com/sheharyaar/iit-kgp-network>

## ACHIEVEMENTS

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### Inter IIT Technology Meet 2023 - ISRO Event

IIT Kanpur, India

1st position | *Python, AWS S3*

February, 2023

- Comprehensive **scraping of lunar images** from Google Moon with Python scripts utilizing the requests library.
- Achieved **seamless and automated high-volume file transfers** by integrating **AWS S3 bucket** to the project using **AWS SDK (Boto3)** in Python.  
Certificate: [https://drive.google.com/file/d/1NYtqQ02zj0J5N1iTdN\\_O\\_rSzB0nYB3Eg/view?usp=sharing](https://drive.google.com/file/d/1NYtqQ02zj0J5N1iTdN_O_rSzB0nYB3Eg/view?usp=sharing)

### Interhall OpenSoft 2022

IIT Kharagpur, India

1st Position | *Go, AWS, K8s, Docker, NGINX, Helm*

April, 2022

- An intra IIT Kharagpur software development competition, part of the technology General Championship.
- Single-handedly established a **robust cloud infrastructure** for the project by leveraging **Docker, Kubernetes (k8s), and Helm charts** on AWS.
- Implemented **optimal load distribution and reverse proxy** by setting up NGINX and ensured efficient system monitoring and visualization using **Prometheus and Grafana**.
- Developed a **scalable backend API** using Swagger, crafted the server in Go with Postgres as the DB, and utilized **gorilla/mux** for routing and **gorm** for model handling.
- Source code - <https://github.com/sheharyaar/opensoft-iitkgp>  
Certificate: <https://drive.google.com/file/d/1kQ-IlftFYbzLXMHl8nPsGkR5mmF6-JoW/view?usp=sharing>

## ADDITIONAL INFORMATION

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### Books studied

- Cloud Computing Concepts Part 1 and 2, University of Illinois at Urbana-Champaign (Coursera).
- Distributed Systems: Concepts and Design Book by George Coulouris, Jean Dollimore, and Tim Kindberg.
- The Linux Programming Interface, Michael Kerrisk.

### Key research and publication readings

- Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.
- Matteo Bertrone (2018), Toward an eBPF-based clone of iptables.
- Prof. Gianpiero Cabodi, OS-level virtualization with Linux containers: process isolation mechanisms and performance analysis of last generation container runtimes.
- Keith Adams, A Comparison of Software and Hardware Techniques for x86 Virtualization.



**INTERIM GRADE CARD**  
**INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR**  
**STATEMENT OF GRADES OBTAINED FOR THE 10 SEMESTER DUAL DEGREE IN ENGINEERING/TECHNOLOGY LEADING TO THE AWARD OF**  
**BACHELOR OF TECHNOLOGY (HONOURS) AND MASTER OF TECHNOLOGY**



**Roll No: 20MI31012**

**Name: MOHAMMAD SHEHAR YAAR TAUSIF**

**Year of Admission : 2020-2021**

**Course: B.Tech.(Hons.) in MINING ENGINEERING and M.Tech. in MINING ENGINEERING**

**Year of Graduation : -**

**Semester 1**

Subno	Name	L-T-P	CRD	GRD
DY17003	DIY PROJECT	0-0-3	2	EX
EA10007	EXTRA ACADEMIC ACTIVITY-I	0-0-3	1	A
EE11003	ELECTRICAL TECHNOLOGY	3-1-0	4	B
EN19003	ENGINEERING LABORATORY	0-0-3	2	B
EV10003	ENVIRONMENTAL SCIENCE	2-0-0	2	B
MA11003	ADVANCED CALCULUS	3-1-0	4	A
ME11003	BASIC ENGINEERING MECHANICS	3-1-0	4	D
PH11003	PHYSICS OF WAVES	3-1-0	4	B
PH19003	PHYSICS LABORATORY	0-0-3	2	EX

**For Semester 1                  SGPA: 8.20                  CGPA: 8.20**

**Semester 2**

Subno	Name	L-T-P	CRD	GRD
BS10003	SCIENCE OF LIVING SYSTEMS	2-0-0	2	A
CE13003	ENGINEERING DRAWING AND COMPUTER GRAPHICS	1-0-3	3	B
CS10003	PROGAMMING AND DATA STRUCTURES	3-0-0	3	EX
CS19003	PROGAMMING AND DATA STRUCTURES LABORATORY	0-0-3	2	EX
CY11003	CHEMISTRY	3-1-0	4	B
CY19003	CHEMISTRY LABORATORY	0-0-3	2	B
EA10008	EXTRA ACADEMIC ACTIVITY-II	0-0-3	1	B
HS13003	ENGLISH FOR COMMUNICATION	2-0-2	3	B
MA11004	LINEAR ALGEBRA, NUMERICAL AND COMPLEX ANALYSIS	3-1-0	4	D

**For Semester 2                  SGPA: 8.17                  CGPA: 8.18**

**Semester 3**

Subno	Name	L-T-P	CRD	GRD
CE21201	SOLID MECHANICS	3-1-0	4	A
EA10009	EXTRA ACADEMIC ACTIVITY-III	0-0-3	1	B
GG20201	GEOLOGY FOR ENGINEERS	3-0-0	3	A
GG29205	GEOLOGY LABORATORY	0-0-3	2	B
MA20205	PROBABILITY AND STATISTICS	3-0-0	3	C
MI20201	DEVELOPMENT OF MINERAL DEPOSITS	3-0-0	3	B
MI21201	ROCK MECHANICS	3-1-0	4	B
MI29201	ROCK MECHANICS LABORATORY	0-0-3	2	B

**For Semester 3                  SGPA: 8.18                  CGPA: 8.18**

**Semester 4**

Subno	Name	L-T-P	CRD	GRD
EA10010	EXTRA ACADEMIC ACTIVITY-IV	0-0-3	1	B
EC21201	BASIC ELECTRONICS	3-1-0	4	A
EC29201	BASIC ELECTRONICS LABORATORY	0-0-3	2	A
HS21201	ECONOMICS	3-1-0	4	A
MI21202	MINE SURVEYING AND GEONFORMATICS	3-1-0	4	A
MI29202	MINE SURVEYING LABORATORY	0-0-3	2	A
MI60242	VISUALIZATION, DIGITAL MINING AND APPLIED 3D PRINTING TECHNOLOGY FOR MINERAL INDUSTRY	3-0-0	3	A
RX60019	HAPPINESS AT WORK	3-0-0	3	C
BT20204	CELL AND MOLECULAR BIOLOGY	3-0-0	3	C

**For Semester 4                  SGPA: 8.50                  CGPA: 8.27**

**Upto Semester 4**

**Total Credit Taken: 97**

**Total Credit Cleared: 97**

**CGPA: 8.27**



## GENERAL INFORMATION

1. Abbreviations used in the grade card stands for:

- LTP = Lecture, Tutorial, Practical; figures shown under this column indicate weekly contact hours prescribed for the Subject  
CRD = Credit carried by the Subject  
GRD = Grade obtained by student in the Subject  
CGPA = Cumulative Grade Point Average  
SGPA = Semester Grade Point Average  
GPA = Grade Point Average

2. English is the medium of instruction at all levels.

3. Extra Academic Activity (EAA) subjects include NCC, NSS and NSO.

4. The seven-point letter grade system followed by the institute in assessing student's performance in a subject is as follows:

Performance	Letter Grade	Grade Point Value Per Credit
Excellent	EX	10
Very Good	A	9
Good	B	8
Fair	C	7
Average	D	6
Pass	P	5
Fail	F	0

5. Highest possible CGPA in the system is 10.00. No rank or class or division is awarded. No system exists for conversion of letter grades into percentage of marks.

6.

- (i) A student is awarded a B.Tech. (Hons.)/B.Arch. (Hons.)/Dual Degree – B.Tech. (Hons.) and M.Tech./ Integrated B.Sc.(Hons.) and M.Sc. / 2Yrs. M.Sc. on completion of the curriculum requirement with a minimum CGPA of 6.00.
- (ii) The credits and grades obtained in additional subjects optionally taken by a student on satisfying the prescribed conditions do not contribute towards the CGPA.
- (iii) The CGPA obtained by a student in additional subjects is computed separately. For the award of MINOR degree in a particular discipline, the credits and grades of the additional and other subjects that are taken into account are separately indicted along with the computed GPA.
- (iv) Minimum GPA for a Minor/micro in any discipline is 6.00.

7. Duration of Course

Minimum duration of the B.Tech. (Hons.)/B.Arch (Hons.)/ Dual Degree – B.Tech. (Hons.) and M.Tech.(or MBA)/ B.Sc.(Hons.) and M.Sc. degree is given on the front cover page. However with the approval of the Senate a slow paced student may take more semesters to complete the degree requirement.

# INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR



## Statement of ACADEMIC PERFORMANCE

### Four Year Programme

### Bachelor of Technology (Honours)

### Five Year Programme

### Bachelor of Architecture (Honours)

### Master of Science (Five Year Integrated Course)

### Bachelor of Technology (Honours)

&

### Master of Technology/MBA (Dual Degree)

### Two Year Programme

### Master of Science

## LETTER OF RECOMMENDATION

To Whomsoever It May Concern,

I am writing to highly recommend Mohammad Shehar Yaar Tausif for Mitacs GRI 2024. As the Founder of Neverinstall, I had the privilege of working closely with Shehar Yaar during their tenure as a Software Engineer Intern from March 2022 to the present. Throughout this period, Shehar has consistently demonstrated exceptional skills, dedication, and a strong passion for technology, particularly in areas that align with the requirements of the projects they are applying to.

Shehar's work at Neverinstall was pivotal in setting up our Linux infrastructure for the virtual desktop, ensuring its seamless operation within containers. Their proficiency in bash scripting was evident as they managed multiple critical scripts and Dockerfiles. Their knowledge of Docker, combined with their expertise in Linux, made them an invaluable asset to our team.

A testament to Shehar's research qualities was their initiative to delve deep into documentation for Xorg, uinput, udev, and many other technologies. This self-driven exploration was essential for the successful implementation of several features at Neverinstall. Their ability to research, comprehend, and apply complex technical documentation to real-world scenarios was truly commendable. Their approach to implementing IPC over Dbus between side-car containers and building an end-to-end flow for automated GPU hotplugging was impressive. Their ability to analyze and create Xorg-based programs for handling display requirements further solidified their proficiency in C programming.

Safety and reliability have always been paramount for us at Neverinstall. Shehar ensured this by creating thread-safe interfaces for Xorg C libraries in Go. Their work in implementing virtual I/O devices within containers showcased their comprehensive understanding of Linux and Container technologies.

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CIN: U80904KA2019PTC122541

GSTIN: 29AAHCG7375A1ZH

Email: [support@neverinstall.com](mailto:support@neverinstall.com)

Website: <https://neverinstall.com>

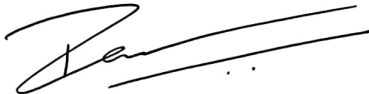
Phone: +91 9686407478

Address: #412A, First Floor, 24th Cross, 18th Main, HSR Layout, Sector 3, Bengaluru, Karnataka - 560102

In conclusion, Shehar is a dedicated, innovative, and highly skilled individual with a deep understanding of Linux, C, bash scripting, Docker, and Operating Systems. I am confident that they will be an invaluable asset to the Mitacs GRI 2024 and any project they choose to undertake. I wholeheartedly recommend Shehar for this opportunity and am certain that they will exceed all expectations.

Please feel free to contact me if you require any further information.

Warm regards,



Ram Pasala  
Co-Founder, Neverinstall  
ram@neverinstall.com

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